IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Carles Borrego Bel et al.

Serial No.: 10/707,922

Filed: January 26, 2004

For: ELECTRICAL DISTRIBUTION SYSTEM AND METHOD FOR A VEHICLE WITH TWO NETWORKS HAVING DIFFERENT VOLTAGE LEVELS

Group Art Unit: 2836

Examiner: Dru M. Parries

Attorney Docket No.: LEAR8136ESPUSA

APPEAL BRIEF UNDER 37 C.F.R. § 41.37

Mail Stop Appeal Brief - Patents
Commissioner for Patents
U.S. Patent & Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This is an Appeal Brief from the final rejection of claims 16-28 of the Office Action mailed on July 9, 2008, for the above-identified patent application.

I. REAL PARTY IN INTEREST

The real party in interest is Lear Corporation ("Assignee"), a corporation organized and existing under the laws of the state of Delaware, and having a place of business at 21557 Telegraph Road, Southfield, MI 48034, as set forth in the assignment recorded in the U.S. Patent and Trademark Office on June 27, 2004, at Reel 014784/Frame 0749.

II. RELATED APPEALS AND INTERFERENCES

There are no appeals, interferences or judicial proceedings known to the Appellant, the Appellant's legal representative, or the Assignee which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 16-28 are pending in this application. Claims 16-28 have been rejected and are the subject of this appeal. Claims 1-15 have been cancelled.

IV. STATUS OF AMENDMENTS

No amendment after final rejection has been filed subsequent to the final rejection.

V. SUMMARY OF CLAIMED SUBJECT MATTER

This application includes (3) independent claims, i.e., 16, 23, and 28.

Claim 16 is directed to an electrical distribution system for a vehicle including a first battery for generating a first voltage level and a second battery for generating a second voltage level that is substantially higher than the first voltage level (e.g., [0024] and Figure 3 elements B1 and B2). The system includes a first DC/DC converter, a second DC/DC converter, and a controller (e.g., [0028] and Figures 2-3 elements C1, C2, C3, and M). The first and second DC/DC converters transfer power to first and second loads in response to the first and second voltage levels (e.g., [0024], [0028] and Figure 3 elements C1, C2 and Q1, Q2, Q4 and Q5). The first load is configured to operate at a first increased power level rating that is greater than the amount of power that is capable of being provided by the first DC/DC converter and the second load is configured to operate at a second increased power level rating that is greater than the amount of power that is capable of being provided by the second DC/DC converter (e.g., [0024], [0028] and Figure 3 elements C1, C2, Q1, Q2, Q4 and Q5). The controller is operably coupled to each of the first and second DC/DC converters and to each of the first and second loads (e.g., [0024], [0028] and Figure 3 elements C1, C2, Q1, Q2, Q4 and Q5). The controller is configured to detect the amount of power that is to be consumed by each of the first and the second loads and to selectively control the first and the second DC/DC converters to cooperate with each other to generate enough power to satisfy at least one of the first increased power level rating of the first load and the second increased power level rating of the second load in response to detecting

that the amount of power that is to be consumed by the at least one of the first and the second loads is approaching the at least one of the first and the second increased power level ratings (e.g., [0024], [0028] and Figure 3 elements C1, C2, Q1, Q2, Q4 and Q5).

Claim 23 is directed to an electrical distribution system for a vehicle that includes a first battery for generating a first voltage level and a second battery for generating a second voltage level that is substantially higher than the first voltage level (e.g., [0024] and Figure 3 elements B1 and B2). The system comprises a first DC/DC converter, a second DC/DC converter, a third DC/DC converter and a controller (e.g., [0028] and Figures 2-3 elements C1, C2, C3 and M). The first, second, and third DC/DC converters transfer power to first, second and third loads in response to the first and second voltage levels (e.g., [0024], [0028] and Figure 3 elements C1, C2, C3, Q1, Q2, Q3, Q4, Q5 and Q6). The first load is configured to operate at a first increased power level rating that is greater than the amount of power that is capable of being produced by the first DC/DC converter (e.g., [0024], [0028] and Figure 3 elements C1, C2, C3, Q1, Q2, Q3, Q4, Q5, and Q6). The second load is configured to operate at a second increased power level rating that is greater than the amount of power that is capable of being produced by the second DC/DC converter (e.g., [0024], [0028] and Figure 3 elements Q2, Q5, and C2). The third load is configured to operate at a third increased power level rating that is greater than the amount of power that is capable of being produced by the third DC/DC converter (e.g., [0024], [0028] and Figure 3 elements Q3, Q6, and C3). The controller is operably coupled to each of the first, the second, and the third DC/DC converters and to each of the first, the second, and the third loads (e.g., [0024], [0028] and Figure 3 elements M, Q1-Q6, and C1-C3). The controller is configured to detect the amount of power that is to be consumed by each of the first, the second, and the third loads and to selectively control at least two of the first, the second, and the third DC/DC converters to cooperate with each other to generate enough power to satisfy at least one of the first increased power level rating of the first load, the second increased power level rating of the second load, and the third increased power level rating of the third load in response to detecting that the amount of power that is to be consumed by the at least one of the

first, the second, and the third loads is approaching the at least one of the first, the second, and the third increased power level ratings (e.g., [0024], [0028] and Figure 3 elements M, Q1-Q6, and C1-C3).

Claim 28 is directed to an electrical system for a vehicle including a first battery for generating a first voltage level; a second battery for generating a second voltage level that is substantially higher than the first voltage level; and first, second, and third DC/DC converters for transferring power to first, second, and third loads in response to the first and second voltage levels (e.g., [0024], [0028] and Figure 3 elements M, C1-C3 and Q1-Q6). The first load is configured to operate at a first increased power level rating that is greater than the amount of power that is capable of being produced by the first DC/DC converter (e.g., [0024], [0028] and Figure 3 elements Q1, Q4, C1). The second load is configured to operate at a second increased power level rating that is greater than the amount of power that is capable of being produced by the second DC/DC converter (e.g., [0024], [0028] and Figure 3 elements Q2 and Q5). The third load is configured to operate at a third increased power level rating that is greater than the amount of power that is capable of being produced by the third DC/DC converter (e.g., [0024], [0028] and Figure 3 elements Q3, Q6, C3). The system comprising a a controller operably coupled to each of the first, the second, and the third DC/DC converters and to each of the first, the second, and the third loads. The controller is configured to detect the amount of power that is to be consumed by each of the first, the second, and the third loads. The controller is further configured to determine which of the at least one of the first, the second, and the third DC/DC converters is generating the lowest amount of power and to selectively control the at least one of the first, the second, and the third DC/DC converters that is generating the lowest amount of power to cooperate with the at least one of the first, the second, and the third DC/DC converters to generate enough power to satisfy the at least one of the first, second, and third increased power level ratings in response to detecting that the amount of power that is to be consumed by the at least one of the first and the second loads is approaching the at least one of the first, the second,

and the third increased power level ratings (e.g., [0024], [0028] and Figure 3 elements M, Q1-Q6, C1-C3).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 16-21, 23-26, and 28 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Pinas et al.* U.S. Patent No. 6,507,506, in view of *Maeda* U.S. Patent No. 6,340,848, and *Schaal* U.S. Patent No. 5,625,546.

Claims 22 and 27 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Pinas et al.* U.S. Patent No. 6,507,506, *Maeda* U.S. Patent No. 6,340,848, and further in view of *Schaal* U.S. Patent No. 5,625,546 and further in view of *Akerson* U.S. Patent No. 6,344,985.

VII. ARGUMENT

A. Claims 16-21, 23-26, and 28 Stand Rejected Under 35 U.S.C. § 103(a) as Being Unpatentable Over *Pinas et al.*, *Maeda* and *Schaal*

M.P.E.P. § 2143 provides:

> [t]he rationale to support a conclusion that the claim would have been obvious is **that all the claimed elements were known in the prior art** and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination yielded nothing more than predictable results to one of ordinary skill in the art. *KSR International Co. v. Teleflex*, 550 U.S. at ___, 82 USPQ2d 1385, 1395 (2007); *Sakraida v. AG Pro, Inc.*, 425 U.S. 273, 282, 189 USPQ 449, 453 (1976); *Anderson's-Black Rock, Inc. v. Pavement Salvage Co.*, 396 U.S. 57, 62-63, 163 USPQ 673, 675 (1969); *Great Atlantic & P. Tea Co. v. Supermarket Equipment Corp.*, 340 U.S. 147, 152, 87 USPQ 303, 306 (1950). "[I]t can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does." *KSR*, 550 U.S. at ____, 82 USPQ2d at 1396. **If any of these findings cannot be made,**

then this rationale cannot be used to support a conclusion that the claim would have been obvious to one of ordinary skill in the art.

(Emphasis added.)

1. Claim 16 Is Separately Patentable Under 35 U.S.C. § 103(a) Over *Pinas et al.*, *Maeda*, and *Schaal*

The proposed combination of *Pinas et al., Maeda*, and *Schaal* does not teach, suggest, or disclose in claim 16,"first and second DC/DC converters for transferring power to first and second loads in response to the first and second voltage levels, wherein the first load is configured to operate at a first increased power level rating that is greater than the amount of power that is capable of being provided by the first DC/DC converter and the second load is configured to operate at a second increased power level rating that is greater than the amount of power that is capable of being provided by the second DC/DC converter [.]"

The Examiner agrees that "Pinas [sic] fails to explicitly teach having first and second converters providing power to first and second loads[.]" (*See*, Final Office Action mailed July 9, 2008, pp. 2, last paragraph - pp. 3, ll. 1). *Maeda* fails to cure the deficiencies of *Pinas et al. Maeda* fails to teach, suggest or disclose the presently claimed "first and second DC/DC converters for transferring power to first and second loads in response to the first and second voltage levels, wherein the first load is configured to operate at a first increased power level rating that is greater than the amount of power that is capable of being provided by the first DC/DC converter and the second load is configured to operate at a second increased power level rating that is greater than the amount of power that is capable of being provided by the second DC/DC converter". *Schaal* fails to cure the deficiencies of *Pinas et al* and *Maeda*.

The Examiner relies on the teachings of *Schaal* to demonstrate that the presently claimed "first and second DC/DC converters for transferring power to first and second loads in response to the first and second voltage levels, wherein the first load is configured to operate at

a first increased power level rating that is greater than the amount of power that is capable of being provided by the first DC/DC converter and the second load is configured to operate at a second increased power level rating that is greater than the amount of power that is capable of being provided by the second DC/DC converter" is known in the art.

In particular, the Examiner characterizes the inverters (I) as taught in *Schaal* to be the presently claimed first and second DC/DC converters. (*See*, Final Office Action mailed July 9, 2008, pp. 3, ll. 5-6, and ll. 18-22). Applicants disagree with the assertion that the inverters (I) of *Schaal* are the presently claimed first and second DC/DC converters. The inverters of *Schaal* are DC to AC converters, not DC to DC converters as presently claimed. *Schaal* explicitly states "a static inverter system for **supplying alternating current electrical power to a load from a source of direct current electrical power** [.]" (*See, Schaal*, col. 3, ll. 3-5, emphasis added). One skilled in the art would also recognize that the inverter generates A/C electrical power in response to D/C electrical power. In view of *Schaal's* explicit characterization of the inverter and the definition commonly known to one skilled in the art of the inverter, it follows that *Schaal* fails to teach, suggest, or disclose the present claimed first and second DC/DC converters.

The Examiner provides the following reason for combining the teachings of *Schaal* to *Pinas et al.* and *Maeda* "[i]t would have been obvious to one of ordinary skill of art at the time of the invention to implement Schaal's plurality of DC/DC converters in each of the distribution boxes and his method of supplying power to each load to be able to supply the exact right amount of power to each load at any given time and subsequently minimize power losses and in turn save money." (See, Final Office Action mailed July 9, 2008, pp. 3., ll. 18-22).

Applicants submit that the combination of *Schaal's* inverters to the architectures of *Pinas et al.* and *Maeda* would render such architectures inoperable for their intended purpose. "If the proposed modification would render the prior art invention being modified unsatisfactory

for its intended purpose, then there is no suggestion or motivation to make the proposed combination." *In re Gordan*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

Further, Applicants submit that the proposed addition of the inverters provides no reasonable expectation of success in operating within the architectures of *Pinas et al.* and *Maeda*. "Evidence showing there was no reasonable expectation of success may support a conclusion of nonobviousness." *In re Rinehart*, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976) (emphasis added).

As exhibited above, *Schaal* provides no such DC/DC converters, but instead disclose inverters configured to generate AC energy in response to DC energy and that any such AC energy generated therefrom cannot be combined with *Pinas et al.* and *Maeda*. For example, *Pinas et al.* and *Maeda* each disclose DC to DC converters. Any such loads or devices coupled to the DC to DC converters of *Pinas et al.* and *Maeda* rely on DC energy to operate as intended. The addition of the AC energy from the inverters of *Schaal* to the various devices of *Pinas et al.* and *Maeda* may render the operation of such devices inoperable upon receipt of the AC energy because the inverters of *Schaal* are not capable of generating the expected DC energy. Further, the addition of the inverters of *Schaal* to the architectures of *Pinas et al.* and *Maeda* provides no reasonable expectation of success and destroys any such predictability that may flow from the combination asserted by the Examiner.

The proposed combination of *Pinas et al.*, *Maeda*, and *Schaal* also fails to teach, suggest, or disclose the presently claimed "controller configured to . . . selectively control the first and the second DC/DC converters to cooperate with each other to generate enough power[.]" Such a condition is clear in view of *Schaal's* implementation of the inverters as noted above. Specifically, the presently claimed controller controls the first and second DC/DC converters to generate a DC based power level to satisfy at least one of the first increased power level rating and the second increased power level rating. As exhibited above, the inverters of *Schaal* are not

capable of generating a DC based power level to satisfy at least one of the first increased power level rating and the second increased power level rating. *Pinas et al.* and *Maeda* fails to cure the deficiencies of *Schaal.*

Applicants traverse the Examiner's assertion that *Schaal* teaches the presently claimed "wherein the first load is configured to operate at a first increased power level rating that is greater than the amount of power that is capable of being provided by the first DC/DC converter and the second load is configured to operate at a second increased power level rating that is greater than the amount of power that is capable of being provided by the second DC/DC converter."

In particular, assuming, *arguendo*, that load A (see Figure 1, element 61) of *Schaal* is the presently claimed first load and that the static inverter 1 (see Figure 1, element 1) of *Schaal* is the presently claimed first DC/DC converter (both points of which Applicants do not agree with), *Schaal* fails to teach, suggest, or disclose that the load A 61 is capable of operating a power level that is greater than that that is capable of being provided by the static inverter 1.

Further, assuming, *arguendo*, that load B (see Figure 1, element 71) of *Schaal* is the presently claimed second load and that the static inverter 2 (see Figure 1, element 2) of *Schaal* is the presently claimed second DC/DC converter (both points of which Applicants do not agree with), *Schaal* fails to teach, suggest, or disclose that the load B 71 is capable of operating a power level that is greater than that that is capable of being provided by the static inverter 2.

At best, *Schaal* teaches setting a maximum current value for the load which is limited by a total of the maximum current capabilities of all the static inverters connected to the load (see claim 1, ll. 51-53). Or simply, that the static inverters current generating capabilities are limited to the maximum current value of the load. *Schaal* fails to teach that the current

generating capabilities of static inverter 1 is less than the amount of current needed by the load 61 and that the static inverter 2 is less than the amount of current needed by the load 71. *Pinas et al.* and *Maeda* fails to cure the deficiencies of *Schaal*.

Since the presently claimed "first and second DC/DC converters for transferring power to first and second loads in response to the first and second voltage levels, wherein the first load is configured to operate at a first increased power level rating that is greater than the amount of power that is capable of being provided by the first DC/DC converter and the second load is configured to operate at a second increased power level rating that is greater than the amount of power that is capable of being provided by the second DC/DC converter; and a controller operably coupled to each of the first and the second DC/DC converters . . . and configure to . . . selectively control the first and the second DC/DC converters to cooperate with each other to generate enough power [.]" is not known in the art, the Examiner has not provided the rationale to support a conclusion that claim 16 is obvious. *KSR*, 550 U.S. at ___, 82 USPQ2d at 1395-1396, M.P.E.P. § 2143 at 129.

For at least these reasons, claim 16 is patentable over the proposed combination of *Pinas et al., Maeda*, and *Schaal.*

2. Claim 17 Is Separately Patentable Under 35 U.S.C. § 103(a) Over *Pinas et al., Maeda*, and *Schaal*

The proposed combination of *Pinas et al.*, *Maeda*, and *Schaal* does not teach, suggest, or disclose claim 17. Claim 17 depends from claim 16. Claim 17 provides "a third DC/DC converter for transferring power to the first and second loads and to a third load, wherein the third load is configured to operate at a third increased power level rating that is greater than the amount of power that is capable of being provided by the third DC/DC converter."

As noted above with the arguments presented in connection with claim 16, *Schaal* fails to teach, suggest, or disclose a DC/DC converter. At best, *Schaal* teaches inverters which are known to generate A/C energy in response to D/C energy. Further, the modification of *Pinas et al.* and *Maeda* to include the inverters of *Schaal* would render any such devices within the architecture's of *Pinas et al.* and *Maeda* inoperable as *Schaal's* inverters are not capable of providing DC energy as needed by the various devices of *Pinas et al.* and *Maeda*. *In re Gordan*, 733 F.2d at 900. The proposed addition of *Schaal's* inverters to the architecture's of *Pinas et al.* and *Maeda* provide no reasonable expectation of success. *In re Rinehart*, 532 F.2d at 1048.

The Examiner has not provided the rationale to support a conclusion that claim 17 is obvious. *KSR*, 550 U.S. at _____, 82 USPQ 2d at 1395-1396, M.P.E.P. § 2143 at 129.

3. Claim 18 Is Separately Patentable Under 35 U.S.C. § 103(a) Over *Pinas et al.*, *Maeda*, and *Schaal*

The proposed combination of *Pinas et al.*, *Maeda* and *Schaal* does not teach, suggest, or disclose claim 18. Claim 18 depends from claim 17. Claim 18 provides "wherein the controller is operably coupled to the third DC/DC converter and to the third load and is further configured to selectively control at least two of the first, the second, and the third DC/DC converters to cooperate with each other to generate enough power to satisfy at least one of the first increased power level rating of the first load, the second increased power level rating of the second load, and the third increased power level rating of the third load in response to detecting that the amount of power that is to be consumed by the at least one of the first, the second and the third loads is approaching the at least one of the first, the second, and the third increased power level ratings."

As noted above with the arguments presented in connection with claim 16, *Schaal* fails to teach, suggest, or disclose a DC/DC converter. At best, *Schaal* teaches inverters which are known to generate A/C energy in response to D/C energy. Further, the modification of *Pinas*

et al. and *Maeda* to include the inverters of *Schaal* would render any such devices within the architecture's of *Pinas et al.* and *Maeda* inoperable as *Schaal's* inverters are not capable of providing DC energy as needed by the various devices of *Pinas et al.* and *Maeda*. *In re Gordan*, 733 F.2d at 900. The proposed addition of *Schaal's* inverters to the architecture's of *Pinas et al.* and *Maeda* provide no reasonable expectation of success. *In re Rinehart*, 532 F.2d at 1048.

The Examiner has not provided the rationale to support a conclusion that claim 18 is obvious. *KSR*, 550 U.S. at _____, 82 USPQ 2d at 1395-1396, M.P.E.P. § 2143 at 129.

4. Claim 19 Is Separately Patentable Under 35 U.S.C. § 103(a) Over *Pinas et al.*, *Maeda*, and *Schaal*

The proposed combination of *Pinas et al.*, *Maeda* and *Schaal* does not teach, suggest, or disclose claim 19. Claim 19 depends from claim 18. Claim 19 provides "wherein the controller is further configured to determine which of the at least one of the first, the second and the third DC/DC converters is generating the lowest amount of power and to control the at least one of the first, the second, and the third DC/DC converters that is generating the lowest amount of power to cooperate with the at least one of the first, the second and the third DC/DC converters to generate enough power to satisfy the at least one of the first, second, and third increased power level ratings."

As noted above with the arguments presented in connection with claim 16, *Schaal* fails to teach, suggest, or disclose a DC/DC converter. At best, *Schaal* teaches inverters which are known to generate A/C energy in response to D/C energy. Further, the modification of *Pinas et al.* and *Maeda* to include the inverters of *Schaal* would render any such devices within the architecture's of *Pinas et al.* and *Maeda* inoperable as *Schaal's* inverters are not capable of providing DC energy as needed by the various devices of *Pinas et al.* and *Maeda*. *In re Gordan*, 733 F.2d at 900. The proposed addition of *Schaal's* inverters to the architecture's of *Pinas et al.* and *Maeda* provide no reasonable expectation of success. *In re Rinehart*, 532 F.2d at 1048.

The Examiner has not provided the rationale to support a conclusion that claim 19 is obvious. *KSR*, 550 U.S. at _____, 82 USPQ 2d at 1395-1396, M.P.E.P. § 2143 at 129.

5. Claim 20 Is Separately Patentable Under 35 U.S.C. § 103(a) Over *Pinas et al.*, *Maeda*, and *Schaal*

The proposed combination of *Pinas et al.*, *Maeda*, and *Schaal* does not teach, suggest, or disclose claim 20. Claim 20 depends from claim 16. Claim 20 provides "wherein the first DC/DC converter is capable of generating a first maximum amount of power and the second DC/DC converter is capable of generating a second maximum amount of power, wherein the first maximum amount of power is equal to the second maximum amount of power."

As noted above with the arguments presented in connection with claim 16, *Schaal* fails to teach, suggest, or disclose a DC/DC converter. At best, *Schaal* teaches inverters which are known to generate A/C energy in response to D/C energy. Further, the modification of *Pinas et al.* and *Maeda* to include the inverters of *Schaal* would render any such devices within the architecture's of *Pinas et al.* and *Maeda* inoperable as *Schaal's* inverters are not capable of providing DC energy as needed by the various devices of *Pinas et al.* and *Maeda*. *In re Gordan*, 733 F.2d at 900. The proposed addition of *Schaal's* inverters to the architecture's of *Pinas et al.* and *Maeda* provide no reasonable expectation of success. *In re Rinehart*, 532 F.2d at 1048.

The Examiner has not provided the rationale to support a conclusion that claim 20 is obvious. *KSR*, 550 U.S. at _____, 82 USPQ 2d at 1395-1396, M.P.E.P. § 2143 at 129.

6. Claim 23 Is Separately Patentable Under 35 U.S.C. § 103(a) Over *Pinas et al.*, *Maeda*, and *Schaal*

The proposed combination of *Pinas et al.*, *Maeda*, and *Schaal* does not teach, suggest, or disclose in claim 23, "first, second, and third DC/DC converters for transferring power to first, second and third loads in response to the first and second voltage levels, wherein

the first load is configured to operate at a first increased power level rating that is greater than the amount of power that is capable of being produced by the first DC/DC converter, the second load is configured to operate at a second increased power level rating that is greater than the amount of power that is capable of being produced by the second DC/DC converter, and the third load is configured to operate at a third increased power level rating that is greater than the amount of power that is capable of being produced by the third DC/DC converter [.]"

The Examiner agrees that "Pinas [*sic*] fails to explicitly teach having first and second converters providing power to first and second loads[.]" (*See*, Final Office Action mailed July 9, 2008, pp. 2, last paragraph - pp. 3, ll. 1). *Maeda* fails to cure the deficiencies of *Pinas et al.* *Maeda* fails to teach, suggest, or disclose the presently claimed "first, second, and third DC/DC converters for transferring power to first, second and third loads in response to the first and second voltage levels, wherein the first load is configured to operate at a first increased power level rating that is greater than the amount of power that is capable of being produced by the first DC/DC converter, the second load is configured to operate at a second increased power level rating that is greater than the amount of power that is capable of being produced by the second DC/DC converter, and the third load is configured to operate at a third increased power level rating that is greater than the amount of power that is capable of being produced by the third DC/DC converter." *Schaal* fails to cure the deficiencies of *Pinas et al.* and *Maeda*.

The Examiner relies on the teachings of *Schaal* to demonstrate that the presently claimed "first and second DC/DC converters for transferring power to first and second loads in response to the first and second voltage levels, wherein the first load is configured to operate at a first increased power level rating that is greater than the amount of power that is capable of being provided by the first DC/DC converter and the second load is configured to operate at a second increased power level rating that is greater than the amount of power that is capable of being provided by the second DC/DC converter" is known in the art.

In particular, the Examiner characterizes the inverters (I) as taught in *Schaal* to be the presently claimed first and second DC/DC converters. (*See*, Final Office Action mailed July 9, 2008, pp. 3, ll. 5-6, and ll. 18-22). Applicants disagree with the assertion that the inverters (I) of *Schaal* are the presently claimed first and second DC/DC converters. The inverters of *Schaal* are DC to AC converters, not DC to DC converters as presently claimed. *Schaal* explicitly states "a static inverter system for **supplying alternating current electrical power to a load from a source of direct current electrical power** [.]" (*See*, *Schaal*, col. 3, ll. 3-5, emphasis added). One skilled in the art would also recognize that the inverter generates A/C electrical power in response to D/C electrical power. In view of *Schaal's* explicit characterization of the inverter and the definition commonly known to one skilled in the art of the inverter, it follows that *Schaal* fails to teach, suggest, or disclose the present claimed first and second DC/DC converters.

The Examiner provides the following reason for combining the teachings of *Schaal* to *Pinas et al.* and *Maeda* "[i]t would have been obvious to one of ordinary skill of art at the time of the invention to implement *Schaal's* plurality of DC/DC converters in each of the distribution boxes and his method of supplying power to each load to be able to supply the exact right amount of power to each load at any given time and subsequently minimize power losses and in turn save money." (See, Final Office Action mailed July 9, 2008, pp. 3., ll. 18-22).

Applicants submit that the combination of *Schaal's* inverters to the architectures of *Pinas et al.* and *Maeda* would render such architectures inoperable for their intended purpose. "If the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed combination." *In re Gordan*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

Further, Applicants submit that the proposed addition of the inverters provides no reasonable expectation of success in operating within the architectures of *Pinas et al.* and

Maeda. "Evidence showing there was no reasonable expectation of success may support a conclusion of nonobviousness." *In re Rinehart*, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976) (emphasis added).

As exhibited above, *Schaal* provides no such DC/DC converters, but instead disclose inverters configured to generate AC energy in response to DC energy and that any such AC energy generated therefrom cannot be combined with *Pinas et al.* and *Maeda*. For example, *Pinas et al.* and *Maeda* each disclose DC to DC converters. Any such loads or devices coupled to the DC to DC converters of *Pinas et al.* and *Maeda* rely on DC energy to operate as intended. The addition of the AC energy from the inverters of *Schaal* to the various devices of *Pinas et al.* and *Maeda* may render the operation of such devices inoperable upon receipt of the AC energy because the inverters of *Schaal* are not capable of generating the expected DC energy. Further, the addition of the inverters of *Schaal* to the architectures of *Pinas et al.* and *Maeda* provides no reasonable expectation of success and destroys any such predictability that may flow from the combination asserted by the Examiner.

The proposed combination of *Pinas et al.*, *Maeda*, and *Schaal* fails to teach, suggest, or disclose the presently claimed "a controller operably coupled to each of the first, the second, and the third DC/DC converters . . . configured to . . . selectively control at least two of the first, the second, and the third DC/DC converters to cooperate with each other to generate enough power [.]" Such a condition is clear in view of *Schaal's* implementation of the inverters as noted above. Specifically, the presently claimed controller controls at least two of the first, the second and the third DC/DC converters to cooperate with each other to generate a DC based power level to satisfy the at least one of the first increased power level rating, the second increased power level rating, and the third power level rating. *Pinas et al.* and *Maeda* fails to cure the deficiencies of *Schaal* as the inverters of *Schaal* are not capable of being combined to the architectures of *Pinas et al.* and *Maeda*.

Applicants traverse the Examiner's assertion that *Schaal* teaches the presently claimed "wherein the first load is configured to operate at a first increased power level rating that is greater than the amount of power that is capable of being produced by the first DC/DC converter, the second load is configured to operate at a second increased power level rating that is greater than the amount of power that is capable of being produced by the second DC/DC converter, and the third load is configured to operate at a third increased power level rating that is greater than the amount of power that is capable of being produced by the third DC/DC converter."

In particular, assuming, *arguendo*, that load A (see Figure 1, element 61) of *Schaal* is the presently claimed first load and that the static inverter 1 (see Figure 1, element 1) of *Schaal* is the presently claimed first DC/DC converter (both points of which Applicants do not agree with), *Schaal* fails to teach, suggest, or disclose that the load A 61 is capable of operating a power level that is greater than that that is capable of being provided by the static inverter 1.

Further, assuming, *arguendo*, that load B (see Figure 1, element 71) of *Schaal* is the presently claimed second load and that the static inverter 2 (see Figure 1, element 2) of *Schaal* is the presently claimed second DC/DC converter (both points of which Applicants do not agree with), *Schaal* fails to teach, suggest, or disclose that the load B 71 is capable of operating a power level that is greater than that that is capable of being provided by the static inverter 2.

At best, *Schaal* teaches setting a maximum current value for the load that is limited by a total of the maximum current capabilities of all the static inverters connected to the load (see claim 1, ll. 51-53). Or simply, that the static inverters current generating capabilities are limited to the maximum current value of the load. *Schaal* fails to teach that the current generating capabilities of static inverter 1 is less than the amount of current needed by the load

61 and that the static inverter 2 is less than the amount of current needed by the load 71. *Pinas et al.* and *Maeda* fails to cure the deficiencies of *Schaal*.

Since the presently claimed "first, second, and third DC/DC converters for transferring power to first, second and third loads in response to the first and second voltage levels, wherein the first load is configured to operate at a first increased power level rating that is greater than the amount of power that is capable of being produced by the first DC/DC converter, the second load is configured to operate at a second increased power level rating that is greater than the amount of power that is capable of being produced by the second DC/DC converter, and the third load is configured to operate at a third increased power level rating that is greater than the amount of power that is capable of being produced by the third DC/DC converter; and a controller operably coupled to each of the first, the second, and the third DC/DC converters and to each of the first, the second, and the third loads and configured to . . . selectively control at least two of the first, the second, and the third DC/DC converters to cooperate with each other to generate enough power [.]" is not known in the art, the Examiner has not provided the rationale to support a conclusion that claim 23 is obvious. *KSR*, 550 U.S. at ___, 82 USPQ2d at 1395-1396, M.P.E.P. § 2143 at 129.

For at least these reasons, claim 23 is patentable over the proposed combination of *Pinas et al., Maeda*, and *Schaal*.

7. Claim 24 Is Separately Patentable Under 35 U.S.C. § 103(a) Over *Pinas et al., Maeda*, and *Schaal*

The proposed combination of *Pinas et al.*, *Maeda*, and *Schaal* does not teach, suggest, or disclose claim 24. Claim 24 depends from claim 23. Claim 24 provides "wherein the controller is further configured to determine which of the at least one of the first, the second, and the third DC/DC converters is generating the lowest amount of power and to control the at least one of the first, the second, and the third DC/DC converters that is generating the lowest

amount of power to cooperate with the at least one of the first, the second, and the third DC/DC converters to generate enough power to satisfy the at least one of the first, second, and third increased power level ratings."

As noted above with the arguments presented in connection with claim 23, *Schaal* fails to teach, suggest, or disclose a DC/DC converter. At best, *Schaal* teaches inverters which are known to generate A/C energy in response to D/C energy. Further, the modification of *Pinas et al.* and *Maeda* to include the inverters of *Schaal* would render any such devices within the architecture's of *Pinas et al.* and *Maeda* inoperable as *Schaal's* inverters are not capable of providing DC energy as needed by the various devices of *Pinas et al.* and *Maeda*. *In re Gordan*, 733 F.2d at 900. The proposed addition of *Schaal's* inverters to the architecture's of *Pinas et al.* and *Maeda* provide no reasonable expectation of success. *In re Rinehart*, 532 F.2d at 1048.

The Examiner has not provided the rationale to support a conclusion that claim 24 is obvious. *KSR*, 550 U.S. at _____, 82 USPQ 2d at 1395-1396, M.P.E.P. § 2143 at 129.

8. Claim 25 Is Separately Patentable Under 35 U.S.C. § 103(a) Over *Pinas et al.*, *Maeda*, and *Schaal*

The proposed combination of *Pinas et al.*, *Maeda*, and *Schaal* does not teach, suggest, or disclose claim 25. Claim 25 depends from claim 23. Claim 25 provides "wherein the first DC/DC converter is capable of generating a first maximum amount of power, the second DC/DC converter is capable of generating a second maximum amount of power, and the third DC/DC converter is capable of generating a third maximum amount of power, wherein the first maximum amount of power, the second maximum amount of power, and the third maximum amount of power are equal to one another."

As noted above with the arguments presented in connection with claim 23, *Schaal* fails to teach, suggest, or disclose a DC/DC converter. At best, *Schaal* teaches inverters which

are known to generate A/C energy in response to D/C energy. Further, the modification of *Pinas et al.* and *Maeda* to include the inverters of *Schaal* would render any such devices within the architecture's of *Pinas et al.* and *Maeda* inoperable as *Schaal's* inverters are not capable of providing DC energy as needed by the various devices of *Pinas et al.* and *Maeda*. *In re Gordan*, 733 F.2d at 900. The proposed addition of *Schaal's* inverters to the architecture's of *Pinas et al.* and *Maeda* provide no reasonable expectation of success. *In re Rinehart*, 532 F.2d at 1048.

The Examiner has not provided the rationale to support a conclusion that claim 25 is obvious. *KSR*, 550 U.S. at _____, 82 USPQ 2d at 1395-1396, M.P.E.P. § 2143 at 129.

9. Claim 28 Is Separately Patentable Under 35 U.S.C. § 103(a) Over *Pinas et al.*, *Maeda*, and *Schaal*

The proposed combination of *Pinas et al.*, *Maeda*, and *Schaal* does not teach, suggest, or disclose in claim 28, "a controller operably coupled to each of the first, the second, and the third DC/DC converters . . . and configured to . . . determine which of the at least one of the first, the second, and the third DC/DC converters is generating the lowest amount of power; and selectively control the at least one of the first, the second, and the third DC/DC converters that is generating the lowest amount of power to cooperate with the at least one of the first, the second, and the third DC/DC converters to generate enough power [.]"

Pinas et al. and *Maeda* fail to teach, suggest, or disclose the presently claimed "controller operably coupled to each of the first, the second, and the third DC/DC converters . . . and configured to . . . determine which of the at least one of the first, the second, and the third DC/DC converters is generating the lowest amount of power; and selectively control the at least one of the first, the second, and the third DC/DC converters that is generating the lowest amount of power to cooperate with the at least one of the first, the second, and the third DC/DC converters to generate enough power[.]" *Schaal* fails to cure the deficiencies of *Pinas et al.* and *Maeda*.

In particular, the Examiner states that the FPM 7 of *Schaal* is the presently claimed controller (see final Office Action mailed July 9, 2008, pp. 3, ll. 8-9). Assuming, *arguendo*, that the FPM 7 of *Schaal* is the presently claimed controller, the FPM 7 of *Schaal* fails to determine which of the least one of the first, the second, and the third DC/DC converters is generating the lowest amount of power; and selectively control the at least one control the at least one of the first, the second, and the third DC/DC converters that is generating the lowest amount of power to cooperate with the at least one of the first, the second, and the third DC/DC converters to generate enough power. For example, the presently claimed first, second, and third DC/DC converters are generally configured to generate a DC based power level. In contrast, *Schaal* provides inverters which are generally configured to generate an AC based power level in response to a DC input. In particular, *Schaal* explicitly states "a static inverter system for supplying alternating current electrical power to a load from a source of direct current electrical power [.]" (*See*, *Schaal*, col. 3, ll. 3-5, emphasis added). One skilled in the art would recognize that the inverter generates A/C electrical energy in response to DC electrical energy.

Since the inverter of *Schaal* generates AC based power, the FPM 7 of *Schaal* is not configured to determine which of the at least one of the first, the second, and the third DC/DC converters is generating the lowest amount of power, or the lowest amount of DC based power. As apparent from its name or label, DC/DC converters generate a DC based signal in response to a DC input. The inverters of *Schaal* are not capable of generating DC based signal and are limited to generating AC based signals. As such, the FPM 7 of *Schaal* is limited to determining AC power outputs, not a DC power output. *Schaal* fails to teach, suggest, or disclose the limitations of claim 28.

Pinas et al. and *Maeda* each fail to cure the deficiencies of *Schaal*. *Pinas et al.* fails to teach, suggest, or disclose a controller configured to determine which of the at least one of the first, the second, and the third DC/DC converters is generating the lowest amount of power. *Maeda* fails to teach, suggest, or disclose the use of a controller altogether.

Since the presently claimed "controller operably coupled to each of the first, the second, and the third DC/DC converters . . . and configured to . . . determine which of the at least one of the first, the second, and the third DC/DC converters is generating the lowest amount of power; and selectively control the at least one of the first, the second, and the third DC/DC converters that is generating the lowest amount of power to cooperate with the at least one of the first, the second, and the third DC/DC converters to generate enough power" is not known in the art, the Examiner has not provided the rationale to support a conclusion that claim 23 is obvious. *KSR*, 550 U.S. at ___, 82 USPQ2d at 1395-1396, M.P.E.P. § 2143 at 129.

For at least these reasons, claim 28 is patentable over the proposed combination of *Pinas et al., Maeda*, and *Schaal.*

D. Claims 22 and 27 Are Patentable Under 35 U.S.C. § 103(a) Over *Pinas et al., Maeda, Schaal* and further in view of *Akerson*

Applicants respectfully request reconsideration and withdrawal of this rejection because the proposed combination of *Pinas et al.*, *Maeda*, *Schaal* and further in view of *Akerson* does not teach, suggest or disclose claims 22 and 27.

Claim 22 depends from claim 16 and is believed to be allowable for the reasons presented above in connection with claim 16.

Claim 27 depends from claim 23 and is believed to be allowable for the reasons presented above in connection with claim 23.

The fee of $540.00 as applicable under the provisions of 37 C.F.R. § 41.20(b)(2) is being charged to Deposit Account No. 02-3978 via electronic authorization submitted concurrently herewith. The Commissioner is hereby authorized to charge any additional fees or credit any overpayments as a result of the filing of this paper to Deposit Account No. 02-3978.

Respectfully submitted,

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Enclosure - Appendices

VIII. CLAIMS APPENDIX

16. An electrical distribution system for a vehicle including a first battery for generating a first voltage level and a second battery for generating a second voltage level that is substantially higher than the first voltage level, the system comprising:

first and second DC/DC converters for transferring power to first and second loads in response to the first and second voltage levels, wherein the first load is configured to operate at a first increased power level rating that is greater than the amount of power that is capable of being provided by the first DC/DC converter and the second load is configured to operate at a second increased power level rating that is greater than the amount of power that is capable of being provided by the second DC/DC converter; and

a controller operably coupled to each of the first and second DC/DC converters and to each of the first and second loads and configured to:

detect the amount of power that is to be consumed by each of the first and the second loads; and

selectively control the first and the second DC/DC converters to cooperate with each other to generate enough power to satisfy at least one of the first increased power level rating of the first load and the second increased power level rating of the second load in response to detecting that the amount of power that is to be consumed by the at least one of the first and the second loads is approaching the at least one of the first and the second increased power level ratings.

17. The system of claim 16 further comprising a third DC/DC converter for transferring power to the first and second loads and to a third load, wherein the third load is configured to operate at a third increased power level rating that is greater than the amount of power that is capable of being provided by the third DC/DC converter.

18. The system of claim 17 wherein the controller is operably coupled to the third DC/DC converter and to the third load and is further configured to selectively control at least two of the first, the second, and the third DC/DC converters to cooperate with each other to generate enough power to satisfy at least one of the first increased power level rating of the first load, the second increased power level rating of the second load, and the third increased power level rating of the third load in response to detecting that the amount of power that is to be consumed by the at least one of the first, the second and the third loads is approaching the at least one of the first, the second, and the third increased power level ratings.

19. The system of claim 18 wherein the controller is further configured to determine which of the at least one of the first, the second and the third DC/DC converters is generating the lowest amount of power and to control the at least one of the first, the second, and the third DC/DC converters that is generating the lowest amount of power to cooperate with the at least one of the first, the second and the third DC/DC converters to generate enough power to satisfy the at least one of the first, second, and third increased power level ratings.

20. The system of claim 16 wherein the first DC/DC converter is capable of generating a first maximum amount of power and the second DC/DC converter is capable of generating a second maximum amount of power, wherein the first maximum amount of power is equal to the second maximum amount of power

21. The system of claim 20 wherein each of the first maximum amount of power and the second maximum amount of power is less than each of the first power rating level of the first load and the second power rating level of the second load.

22. The system of claim 16 wherein the first and the second DC/DC converters are bi-directional.

23. An electrical distribution system for a vehicle including a first battery for generating a first voltage level and a second battery for generating a second voltage level that is substantially higher than the first voltage level, the system comprising:

first, second, and third DC/DC converters for transferring power to first, second and third loads in response to the first and second voltage levels, wherein the first load is configured to operate at a first increased power level rating that is greater than the amount of power that is capable of being produced by the first DC/DC converter, the second load is configured to operate at a second increased power level rating that is greater than the amount of power that is capable of being produced by the second DC/DC converter, and the third load is

configured to operate at a third increased power level rating that is greater than the amount of power that is capable of being produced by the third DC/DC converter; and

a controller operably coupled to each of the first, the second, and the third DC/DC converters and to each of the first, the second, and the third loads and configured to:

detect the amount of power that is to be consumed by each of the first, the second, and the third loads;

selectively control at least two of the first, the second, and the third DC/DC converters to cooperate with each other to generate enough power to satisfy at least one of the first increased power level rating of the first load, the second increased power level rating of the second load, and the third increased power level rating of the third load in response to detecting that the amount of power that is to be consumed by the at least one of the first, the second, and the third loads is approaching the at least one of the first, the second, and the third increased power level ratings.

24. The system of claim 23 wherein the controller is further configured to determine which of the at least one of the first, the second, and the third DC/DC converters is generating the lowest amount of power and to control the at least one of the first, the second, and the third DC/DC converters that is generating the lowest amount of power to cooperate with the at least one of the first, the second, and the third DC/DC converters to generate enough power to satisfy the at least one of the first, second, and third increased power level ratings.

25. The system of claim 23 wherein the first DC/DC converter is capable of generating a first maximum amount of power, the second DC/DC converter is capable of generating a second maximum amount of power, and the third DC/DC converter is capable of generating a third maximum amount of power, wherein the first maximum amount of power, the second maximum amount of power, and the third maximum amount of power are equal to one another.

26. The system of claim 25 wherein each of the first maximum amount of power, the second maximum amount of power, and the third maximum amount of power is less than each of the first power rating level of the first load , the second power rating level of the second load and the third power rating level of the third load..

27. The system of claim 23 wherein the first, the second, and the third DC/DC converters are bi-directional.

28. An electrical system for a vehicle including a first battery for generating a first voltage level; a second battery for generating a second voltage level that is substantially higher than the first voltage level; and first, second, and third DC/DC converters for transferring power to first, second, and third loads in response to the first and second voltage levels, wherein the first load is configured to operate at a first increased power level rating that is greater than the amount of power that is capable of being produced by the first DC/DC converter, the second

load is configured to operate at a second increased power level rating that is greater than the amount of power that is capable of being produced by the second DC/DC converter, and the third load is configured to operate at a third increased power level rating that is greater than the amount of power that is capable of being produced by the third DC/DC converter, the system comprising:

a controller operably coupled to each of the first, the second, and the third DC/DC converters and to each of the first, the second, and the third loads and configured to:

detect the amount of power that is to be consumed by each of the first, the second, and the third loads;

determine which of the at least one of the first, the second, and the third DC/DC converters is generating the lowest amount of power; and

selectively control the at least one of the first, the second, and the third DC/DC converters that is generating the lowest amount of power to cooperate with the at least one of the first, the second, and the third DC/DC converters to generate enough power to satisfy the at least one of the first, second, and third increased power level ratings in response to detecting that the amount of power that is to be consumed by the at least one of the first and the second loads is approaching the at least one of the first, the second, and the third increased power level ratings.

IX. EVIDENCE APPENDIX

None

X. RELATED PROCEEDINGS APPENDIX

None